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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/046,218	01/16/2002	Valery M. Dubin		4377

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EXAMINER

EDWARDS, LAURA ESTELLE

ART UNIT	PAPER NUMBER
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1734

DATE MAILED: 10/17/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/046,218

Applicant(s)

DUBIN ET AL.

Examiner

Laura E. Edwards

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 5/19/03.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) 16-27 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15, 28 and 29 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

Election/Restrictions

This application contains claims 16-27 drawn to an invention nonelected without traverse in Paper No. 6. A complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1, 4, 6-10, 13-15, 28, and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shacham-Diamand et al (US 6,065,424) in view of Takeshita et al (US 6,248,168).

Shacham-Diamand et al teach a spray deposition apparatus comprising a sealable processing chamber (40) including a cover (not numbered in Fig. 2), an inlet (48) to provide pressurizing gas or vapor to the chamber, a pressure regulator (50) to regulate the gas supply and thereby regulate the pressure in the chamber, a sprayer (58) in the chamber for spraying an electroless plating solution provided from a source or mixer (10) onto a substrate, and a drain (52) to drain the plating solution. A waste line (26) is in fluid communication with the inert gas supply (46) as well as the processing chamber (40) such that it would serve as an either an additional exhaust line or drain with respect to the processing chamber. Shacham-Diamand et al are silent concerning the cover being movable between an open and closed position, the closed position sealing the processing chamber for pressurization. However, it was known in the art at the time the invention was made to provide in a spray deposition apparatus, an automated cover

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movable between an open and closed position with the closed position sealing the processing chamber for pressurization as evidenced by Takeshita et al (see col. 30, lines 29-32 and col. 31, lines 26-27). It would have been obvious to one of ordinary skill in the art to provide the automated cover as taught by Takeshita et al in the Shacham-Diamand et al apparatus to facilitate sealing of the chamber for pressurization without the need of an operator.

Even though Shacham-Diamand et al do not explicitly state how gas pressure is released in the processing chamber such as through an exhaust line separate from the drain line, it was known in the art at the time the invention was made, to provide an exhaust line (29) separate from a drain line (28) in communication with the deposition chamber in order to exhaust pressurizing gas or vapor from the deposition chamber as evidenced by Takeshita et al (see col. 28, lines 10+; see Fig. 25). It would have been obvious to one of ordinary skill in the art to provide an exhaust line, separate from the drain line in communication with a spray deposition chamber, as taught by Takeshita et al, on the Shacham-Diamand et al processing chamber in order to quickly and efficiently release pressurized gas or vapor from the processing chamber when recycling of the gas or vapor is not necessary or desired.

With respect to claims 7, 8, and 13, see Shacham-Diamand et al, col. 6, lines 27-48.

With respect to claim 10, see Shacham-Diamand et al, turntable (56).

With respect to claim 14, Shacham-Diamand et al teach a processing chamber (40) having a cover (not numbered), means for pressurizing the chamber (46), means for regulating pressure in the chamber (50), and means for spraying (58) an electroless plating solution onto at least one substrate. Shacham-Diamand et al do not teach or suggest the cover being movable between an open and closed position, the closed position sealing the processing chamber for

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pressurization. However, it was known in the art at the time the invention was made to provide in a spray deposition apparatus an automated cover movable between an open and closed position with the closed position sealing the processing chamber for pressurization as evidenced by Takeshita et al (see col. 30, lines 29-32 and col. 31, lines 26-27). It would have been obvious to one of ordinary skill in the art to provide the automated cover as taught by Takeshita et al in the Shacham-Diamand et al apparatus to facilitate sealing of the chamber for pressurization without the need of an operator.

With respect to claim 15, see Shacham-Diamand et al, col. 6, lines 44-48.

With respect to claims 28 and 29, see Shacham-Diamand et al, col. 6, lines 49-52.

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shacham-Diamand et al (US 6,065,424) and Takeshita et al (US 6,248,168) as applied to claims 1, 4, 6-10, 13-15, 28, and 29 above, and further in view of Talieh et al (US 6,248,398).

The teachings of Shacham-Diamand et al and Takeshita et al have been mentioned above but neither teach or suggest the chamber cover sealed to the chamber body via an o-ring. However, it was known in the art, at the time the invention was made, to provide an o-ring to effectively seal a spray/gas deposition chamber cover and chamber body for pressurization as evidenced Talieh et al (see col. 3, lines 45-7). It would have been obvious to one of ordinary skill in the art to provide an o-ring seal as taught by Talieh et al in the deposition apparatus as defined by the combination above in order to effectively seal the chamber cover and chamber body for pressurization during processing of a substrate.

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Claims 1-3, 6-15, 28, and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shacham-Diamand et al (US 6,065,424) in view of Talieh et al (US 6,248,398).

Shacham-Diamand et al teach a spray deposition apparatus comprising a sealable processing chamber (40) including a cover (not numbered in Fig. 2), an inlet to provide pressurizing gas or vapor to the chamber (48), a pressure regulator (50) to regulate the gas supply and thereby regulate the pressure in the chamber, a sprayer (58) in the chamber for spraying a desired coating solution onto a substrate, and a drain (17 and 17b) to drain the coating fluid(s). A waste line (26) is in fluid communication with the inert gas supply (46) as well as the processing chamber (40) such that it would serve as either an additional exhaust line or drain with respect to the processing chamber. Shacham-Diamand et al do not teach or suggest the chamber including at least one section movable between an open and closed position, the closed position sealing the processing chamber for pressurization. However, it was known in the art at the time the invention was made to provide in a deposition processing chamber, an automated chamber body and stationary cover whereby the chamber body moves between open and closed positions as evidenced by Talieh et al (see col. 6, lines 65+ to col. 7, lines 1-2). It would have been obvious to one of ordinary skill in the art to provide an automated chamber body as taught by Talieh et al in the Shacham-Diamand et al apparatus to facilitate sealing of the chamber for pressurization without the need of an operator.

Even though Shacham-Diamand et al do not explicitly state how gas pressure is released in the processing chamber such as through an exhaust line separate from the drain line, it was known in the art at the time the invention was made, to provide a gas exhaust line (61) separate from a drain line (17a, 17b) in communication with the deposition chamber in order to exhaust

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pressurizing gas or vapor from the deposition chamber as evidenced by Talieh et al (see col. 6, lines 42-49; see Fig. 4). It would have been obvious to one of ordinary skill in the art to provide an exhaust line, separate from the drain line in communication with a spray deposition chamber, as taught by Talieh et al, on the Shacham-Diamand et al processing chamber in order to quickly and efficiently release pressurized gas or vapor from the processing chamber when recycling of processing fluids is desired.

With respect to claim 3, even though Shacham-Diamand et al show a cylindrically shaped chamber body and cover, Shacham-Diamand et al do not teach an o-ring sealing the chamber body and cover. However, it was known in the art, at the time the invention was made, to provide an o-ring to effectively seal a spray/gas deposition chamber cover and chamber body for pressurization as evidenced Talieh et al (see col. 3, lines 45-7). It would have been obvious to one of ordinary skill in the art to provide an o-ring seal between the chamber body and cover in the apparatus as defined by the combination above in order to effectively seal the chamber cover and chamber body for pressurization during processing of a substrate.

With respect to claims 7, 8, and 13, see Shacham-Diamand et al, col. 6, lines 27-48.

With respect to claim 10, see Shacham-Diamand et al, turntable (56).

With respect to claim 14, Shacham-Diamand et al teach a processing chamber (40) having a cover (not numbered), means for pressurizing the chamber (46), means for regulating pressure in the chamber (50), and means for spraying (58) an electroless plating solution onto at least one substrate. Shacham-Diamand et al do not teach or suggest do not teach or suggest the chamber including at least one section movable between an open and closed position, the closed position sealing the processing chamber for pressurization. However, it was known in the art at

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the time the invention was made to provide in a deposition processing chamber, an automated chamber body and stationary cover whereby the chamber body moves between open and closed positions as evidenced by Talieh et al (see col. 6, lines 65+ to col. 7, lines 1-2). It would have been obvious to one of ordinary skill in the art to provide an automated chamber body as taught by Talieh et al in the Shacham-Diamand et al apparatus to facilitate sealing of the chamber for pressurization without the need of an operator.

With respect to claim 15, see Shacham-Diamand et al, col. 6, lines 44-48.

With respect to claims 28 and 29, see Shacham-Diamand et al, col. 6, lines 49-52.

Response to Arguments

Applicants contend that Shacham-Diamond et al do not teach the combination of a drain line, exhaust line, and a pressure regulator regulating pressure within the processing chamber.

This argument is not deemed persuasive because Shacham-Diamond et al teach a drain line (52) and pressure regulator (50). Shacham-Diamond et al also show a waste line (26) in fluid communication with the processing chamber as well as with all the fluid supply lines which would provide for an additional exhaust or drain line (26). Regardless, the routineer in the wafer deposition art, recognizes the use of a drain line and separate exhaust line in fluid communication with a wafer deposition processing chamber as evidenced by Takeshita et al (see col. 30, lines 29-32 and col. 31, lines 26-27). Therefore, Applicants' claimed combination of features (drain line, pressure regulator, and exhaust line) connected to the processing chamber is deemed to be within the level of ordinary skill in the art and does not result in patentability.

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Applicants contend that the Takeshita et al patent is directed to a spin coating apparatus which is different than the electroless deposition apparatus of Shacham-Diamond et al apparatus such that one of ordinary skill in the art would not be motivated to combine the teachings of Shacham-Diamond et al with Takeshita et al.

This argument is not deemed persuasive because both patents to Shacham-Diamond et al and Takeshita et al relate to apparatus and methods for spray deposition on a wafer, specifically both patents relate to semiconductor wafer fabrication technology (see Shacham- col. 3, lines 37+, col. 8, lines 7+, and Takeshita - col. 1, lines 15+).

Applicants contend that the Talieh et al patent does not remedy any of the basic deficiencies noted with respect to the combination of Shacham-Diamond et al and Takeshita et al such that claim 5 is patentable.

Claim 5 is not deemed patentable because the combination of Shacham-Diamond et al and Takeshita et al is deemed proper for the reasons set forth above and the Talieh et al patent properly remedies those teachings lacking of the Shacham-Diamond et al and Takeshita et al combination.

Applicants contend that the teachings of Shacham-Diamond et al are deficient to meet Applicants' claimed invention and one of ordinary skill in the art would not have combined the teachings of Talieh et al with Shacham-Diamond et al to result in the presently claimed invention.

This argument is not deemed persuasive because Shacham-Diamond et al substantially teach the invention as claimed with the exception of an explicit recitation of a separate drain [for liquid] and an exhaust line [for gas]. However, Talieh et al recognize such a teaching for use in a

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wafer deposition apparatus (see col. 6, lines 42-49; see Fig. 4). The combination is deemed reasonable and within the level of ordinary skill in the art.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Laura E. Edwards whose telephone number is (703) 308-4252. The examiner can normally be reached on M-Th/First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Crispino can be reached on (703) 308-3853. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.



Laura E. Edwards
Primary Examiner
Art Unit 1734

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October 9, 2003